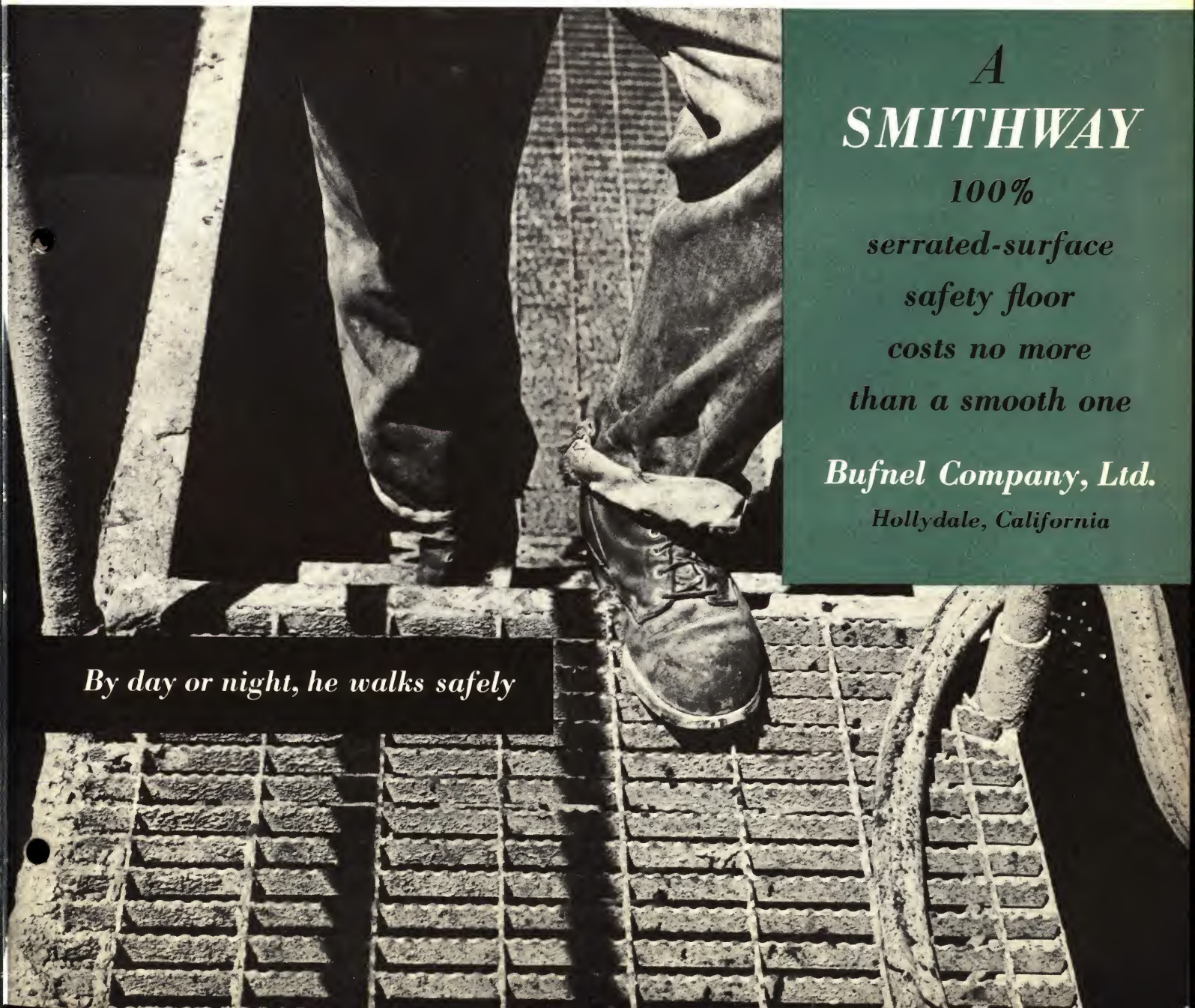
THE FACTS ABOUT OPEN STEEL FLOOR GRATING and INDUSTRIAL SAFETY



By day or night, he walks safely

A
SMITHWAY
100% serrated-surface safety floor costs no more than a smooth one

Bufnel Company, Ltd.
Hollydale, California

You can buy a safe open steel floor for the price of a smooth one

INDUSTRIAL ACCIDENTS COST MONEY

This man is worth more to himself and to his employer when he's on the job instead of flat on his back. Industrial accidents cost money. Forward-looking employers are safety-minded employers. One way to keep a worker on the job is to keep a safe floor under his feet. This man is standing on one now.

You don't hang a dollar sign on an industrial worker's safety.

You don't have to when you buy a Smithway serrated-surface safety-floor.

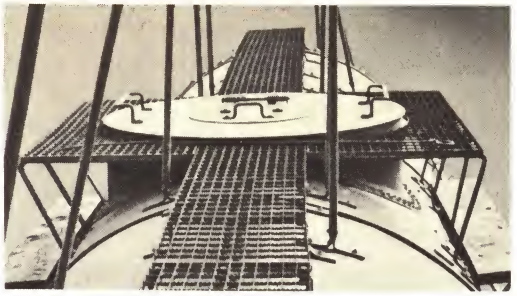
It costs no more than a smooth floor. That's because it is manufactured as a stock line. It doesn't have to be built to special order.

Smithway open steel floors are engineered to your job by people you can depend on — manufactured by people you can depend on.

A. O. Smith Corporation manufactures the Smithway line of industrial floor grating. A. O. Smith is a name that stands for integrity of product. It is one of world industry's most respected names.

Bufnel Company, Ltd., represents A. O. Smith in the sale of Smithway grating in the Western States. We are engineers and steel fabricators. We help engineer your floor. We make up the panels out of our large West Coast stocks.

For prices and other information, write or phone your nearest Bufnel office. See back cover.



A BRAKEMAN'S LIFELINE

A tank car walkway *has got to be safe.* It was for railway car walkways that A. O. Smith first developed a serrated-surface floor grating.

But industrial safety is a problem everywhere. Today the Smithway line of safety-flooring is complete. Where an industrial floor goes in, there's a Smithway safety grating to do the job.

EVERY STEP HE TAKES IS A SAFE ONE

When it comes to industrial safety, slips always count. A man has got to stay on his feet to stay healthy. He does that on a Smithway open steel safety-floor. You can buy this safety-floor for the price of a smooth one.

THESE TEETH GRIP BOTH WAYS

When a man's feet slip, they don't choose the direction of slip. A safe floor is one that never loosens its grip on a man's shoes. A safe floor is one that offers non-skid protection in every direction.

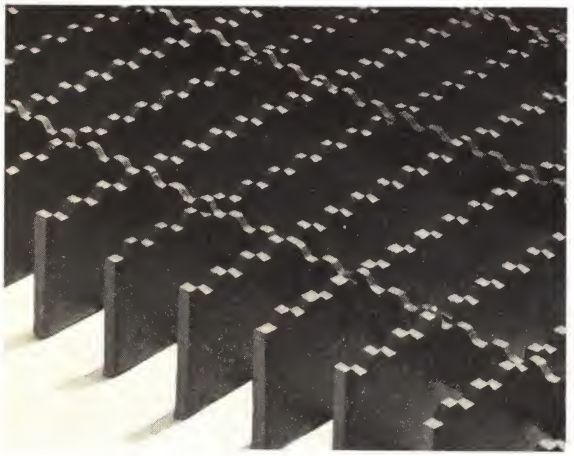
Well, a Smithway floor won't sneak out from under a man. It's made with a grip that moves in from every direction. Look at the picture. Look at the serrations on *both the bearing bars and the cross bars.* With a floor like that, safety travels a two-way street.

EASY TO WALK ON, EASY TO ROLL ON

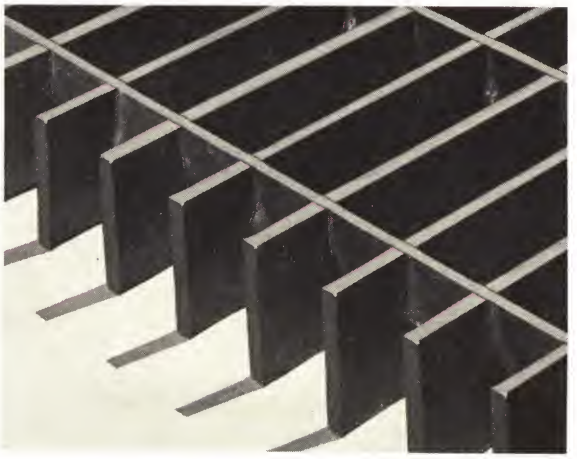
Walk across a Smithway safety-floor. Push a hand truck across it. It's a floor that's easy to walk on, easy to roll on. That's because the serrations are *flat on top.* It's the edges of the serrations that do the gripping. Safety in a floor is both a non-skid and a non-fatigue proposition.

SMITHWAY OPEN STEEL FLOOR GRATING

Two surfaces



100% Serrated-surface safety grating



Smooth-surface grating

Three types

"Type" designation tells distance between bearing bars. (Bearing bars are the heavy load-carrying beams.)

Type A 1.458″ between bearing bars
Type B 1.000″ between bearing bars
Type C 0.750″ between bearing bars

Cross bars are the same distance apart in all types of Smithway grating. That distance is 3.50″. (Cross bars are the smaller load-distribution members.)

Bearing bars (in all three types) are made in these sizes:

Thickness: ⅛″ or 3/16″

Depth: 1″... 1¼″... 1½″... 1¾″... 2″... 2¼″

For prices and other information, write or phone your nearest Bufnel office. See back cover.

The code number

... it simplifies selection

B-2-100-S is a Code Number. It means: B for Type B; 2 for 2/16″ bearing bar thickness; 100 for 1.00″ bearing bar depth; S for Serrated surface.

C-3-225-P is another Code Number. It means: C for Type C; 3 for 3/16″ bearing bar thickness; 225 for 2.25″ bearing bar depth; P for smooth (Plain) surface.

The complete range of selections

The full range of Type B gratings listed below is available also in Types A and C.

B-2-100-S or P
B-2-125-S or P
B-2-150-S or P
B-3-100-S or P
B-3-125-S or P
B-3-150-S or P
B-3-175-S or P
B-3-200-S or P
B-3-225-S or P

The length of a panel

A floor is made up of panels. The length of a panel is the length of the bearing bars. The bearing bars are beams. They carry the load (while cross bars help distribute the load). Bearing bars must run at right angles to supports.

The bearing bars may span the distance between two supports (simple beam). Or they may span the distance across three or more supports.

Where the floor panels are to be removed from time to time, it is well to hold to panel lengths that will make for ease of handling.

Standard panel widths

Since the bearing bars carry the load, there is no need to support the panels along their edges. Panels are laid side-by-side, edges unsupported.

For that reason, panel widths have been standardized. That helps keep the price down. See the tables for those standards.

Tables of panel widths

Type A

1/8" Bearing Bar				3/16" Bearing Bar			
5 3/16	11 9/16	17 7/8	24 3/16	5 7/16	12	18 5/8	25 3/16
6 13/16	13 1/8	19 7/16	25 3/4	7 1/16	13 11/16	20 1/4	26 13/16
8 3/8	14 5/8	21	27 3/8	8 3/4	15 5/16	21 7/8	28 7/16
9 15/16	16 1/4	22 5/8	28 15/16	10 3/8	16 15/16	23 1/2	30 1/4

Type B

1/8" Bearing Bar				3/16" Bearing Bar			
7 3/16	12 13/16	18 7/16	24 1/16	6 7/16	12 3/8	18 5/16	24 1/4
8 5/16	13 15/16	19 9/16	25 3/16	7 5/8	13 9/16	19 1/2	25 7/16
9 7/16	15 1/16	20 11/16	26 5/16	8 13/16	14 3/4	20 11/16	26 5/8
10 9/16	16 3/16	21 13/16	27 7/16	10	15 15/16	21 7/8	27 13/16
11 11/16	17 5/16	22 15/16	28 9/16	11 3/16	17 1/8	23 1/16	29

Type C

1/8" Bearing Bar				3/16" Bearing Bar			
10 3/4	15 7/16	20 1/8	24 13/16	10 13/16	15 1/2	20 3/16	24 7/8
11 11/16	16 3/8	21 1/16	25 3/4	11 3/4	16 7/16	21 1/8	25 13/16
12 5/8	17 5/16	22	26 11/16	12 11/16	17 3/8	22 1/16	26 3/4
13 9/16	18 1/4	22 15/16	27 5/8	13 5/8	18 5/16	23	27 11/16
14 1/2	19 3/16	23 7/8	28 9/16	14 9/16	19 1/4	23 15/16	28 5/8

All dimensions in inches

Two suggestions: Here are two things you can do to simplify your order and to help us process and deliver your order quickly: (1) Keep the number of different panel-widths to the minimum. For a long trench-cover, for instance, make all but the end-panel the same width. (2) When possible, specify the panel-widths shown in white squares in the tables above. Those widths are used in 90% of the floors we make up.

A look at the three types

Any one of the three types may satisfy a given load-span condition. But each of the three types has a general best-range of application. Sometimes, for instance, a physical condition that has nothing to do with loads and spans will point to the choice.

Type B is the standard grating as defined by Federal Specifications. It accounts for some 90% of floor-grating sales.

Type A has wider spacings between bearing bars than Type B. Thus, for the same size bearing bars, it costs less and has 70% of the load capacity.

Specify Type A where load capacity is not critical, as for armoring concrete floors, for storm-drain openings, industrial grilles, etc.

Specify Type A for walkways or trench covers where loads and spans are relatively low: Say for spans under 2½ feet with uniform loads under 300 lbs. per sq. ft. By doing that, you will save money.

Type C has the narrowest openings between bearing bars. For the same size bearing bars, it has a 25% greater load capacity than Type B.

Specify Type C when you want narrower openings between bearing bars—say to prevent ladies' high heels from catching in the openings.

Specify Type C when, for a given span, the load is up to 25% greater (but no more) than the capacity of the heaviest Type B grating. (See Chart, page 7.)

The complete range of weights

Code Number A, B or C	Size of Bearing Bars	lbs per sq ft A	B	C
-2-100-S or P	1/8" x 1"	4.0	5.3	7.0
-2-125-	1/8" x 1 1/4"	4.3	6.4	8.5
-2-150-	1/8" x 1 1/2"	5.7	7.6	10.0
-3-100-	3/16" x 1"	5.5	7.2	9.0
-3-125-	3/16" x 1 1/4"	6.7	9.0	11.1
-3-150-	3/16" x 1 1/2"	8.5	11.0	13.7
-3-175-	3/16" x 1 3/4"	9.7	12.6	16.0
-3-200-	3/16" x 2"	11.3	14.6	18.2
-3-225-	3/16" x 2 1/4"	12.5	16.3	20.3

How to make your selection

First, determine the maximum weight you want the floor to carry. Reduce it to a uniform load, in pounds per sq ft. Or reduce it to a concentrated load, in pounds per ft of floor width. The uniform-load method is most common.

Next, you need to know the length of unsupported span. If the supporting structure exists, you know that span. For a new installation, your support-structure design determines the span. The Chart (opposite page) offers a quick way to determine a practical range of spans for a given uniform load. With a general span-range in mind, you have leeway to shift your floor-supports to meet other conditions.

Now you can get the CODE NUMBER (see page 4) that describes the particular grating which best meets your design conditions.

If you are designing to a uniform load, take your load-span data either to the Chart (opposite page) or to the Table (page 8) to get that Code Number. If you are designing to a concentrated load, the Table alone will give you the Code Number.

Grating selection chart

Uniform loads only

The Selection Chart is based on span-load-deflection data for Type B grating under uniform loading.

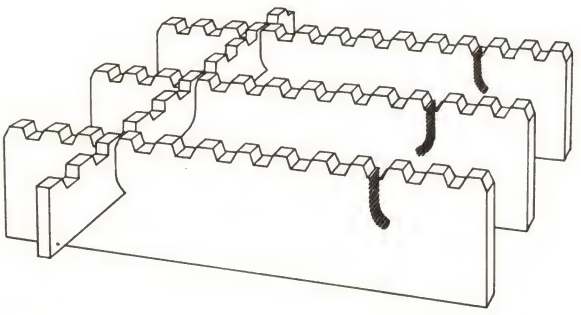
It was developed from the data in the Grating Selection Table (page 8).

The Chart was developed to assist engineers who prefer the quick-reading, quick-interpolation features of plotted data.

The Chart helps in another way. Its load range is greater.

Grating that's locked-for-life

Smithway grating *stays* in one piece. Cross bars and bearing bars cannot come apart, no matter how severe the service. Here's the reason:

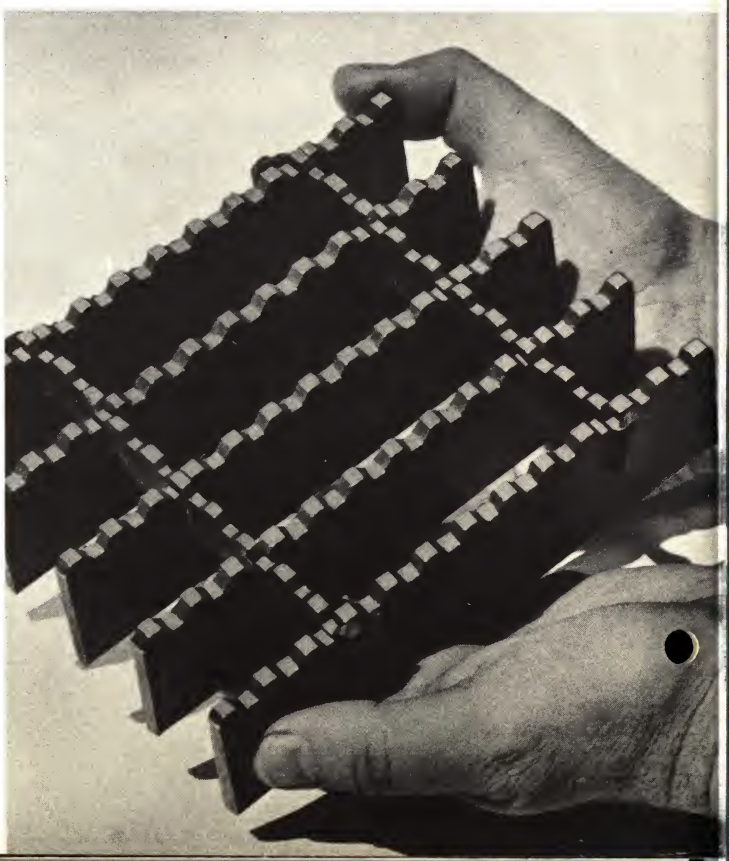


Bearing bars have "J" slots into which cross bars are forced under tremendous pressure.

But in alternate bearing bars those slots curve in *opposite* directions.

Result: Cross bars are hooked into bearing bars with a double twist. In one bearing bar, a cross bar hooks down in one direction. In the next, it hooks down in the opposite direction. The top edge of a cross bar lines straight across the bearing bars. But pick up a piece of Smithway grating and look at that zigzag bottom edge. That tells why Smithway grating *stays* in one piece.

Pictured below is a handful of grating that's built to stay in one piece. Smithway grating is strong and . . . permanent.



How to use the uniform load selection chart

(examples)

Type B

Design Load: 1250 lbs/sq ft
Unsupported span: 2'8"
Selection: B-3-175
(Illustrated on chart)

Type A

Design Load: 300 lbs/sq ft
Span: 2'6"
Load-conversion factor: .70
$\frac{300}{.70}$ = 428 lbs/sq ft
Selection: A-3-100

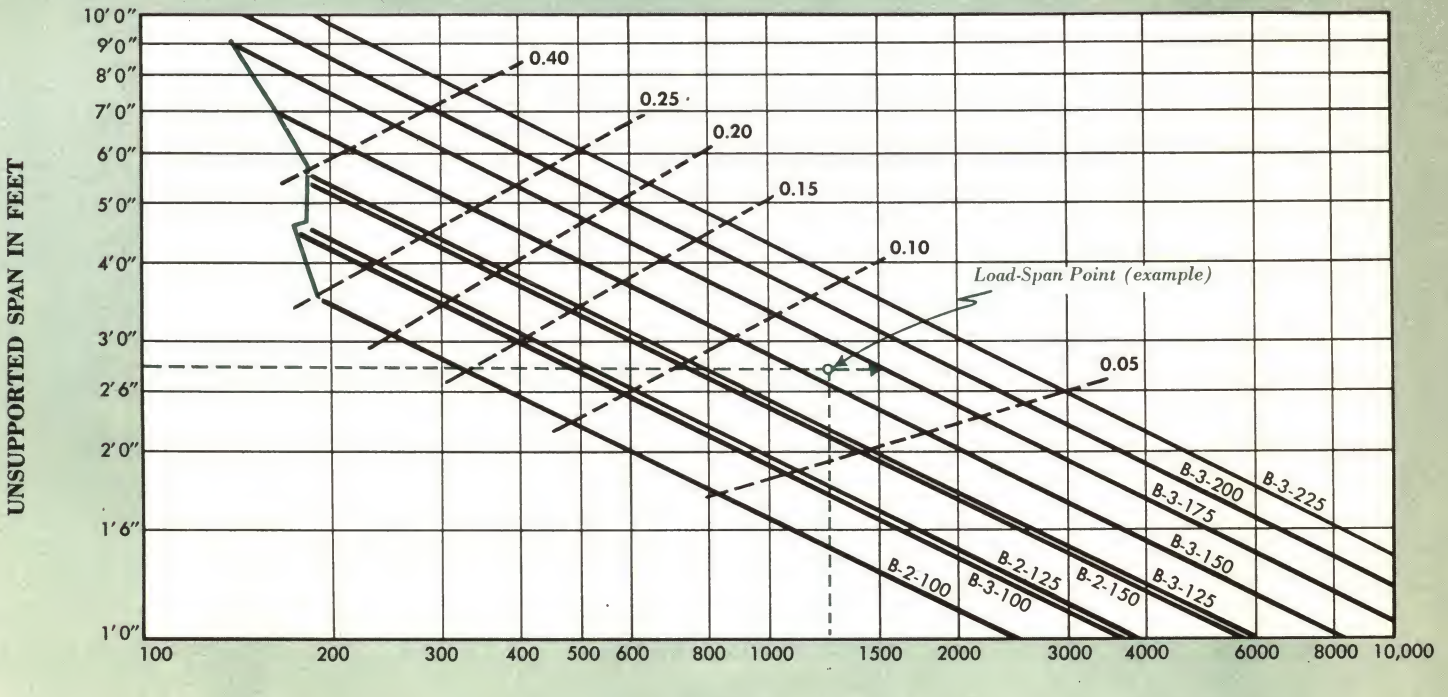
Type C

Design Load: 1000 lbs/sq ft
Span: 3 ft
Load-conversion factor: 1.25
$\frac{1000}{1.25}$ = 800 lbs/sq ft
Selection: C-3-150

Select grating represented by first line right of your load-span point on chart.
Dotted lines on chart indicate deflection in inches.
Heavy green line on chart is safe-deflection limit. Do not interpolate into area left of that line.

Types A or C. When using the chart for Type A or C selections, be sure to change the prefix letter B to A or C, respectively, as shown in the examples above.

GRATING SELECTION CHART



SAFE UNIFORM LOAD IN LBS/SQ FEET—TYPE B GRATING

FOR TYPE B Direct reading
FOR TYPE A Load-conversion factor =.70
FOR TYPE C Load-conversion factor = 1.25

Fiber stress. Maximum allowable 16,000 lbs per sq inch
Federal specification. Chart is based on Federal Specification RR-G-661a

Grating selection table

For uniform or concentrated loads

Either the Table (below) or the Chart (page 7) gives you selections for Type B grating under *uniform* loading.

The Table develops further data for Type B grating under *concentrated* loading.

To make Type A or Type C selections, use their respective load-conversion factors, in the manner outlined in the examples that tell how to use the Chart (page 7).

U = Safe Uniform Load in lbs per sq ft of floor-panel area
C = Safe Concentrated Load in lbs per ft of floor-panel width
D = Deflection in inches

CODE NUMBER		2'0"	2'6"	3'0"	3'6"	4'0"	4'6"	5'0"	5'6"	6'0"	6'6"	7'0"	8'0"	9'0"
B-2-100- (S or P)	U	600	384	267	188	150								
	D	.064	.099	.143	.195	.256								
	C	600	480	400	330	300								
	D	.051	.080	.115	.156	.205								
B-3-100-	U	900	580	400	286	225								
	D	.064	.099	.143	.195	.256								
	C	900	725	600	500	450								
	D	.051	.080	.115	.156	.205								
B-2-125-	U	950	600	420	303	232	184	146	120					
	D	.051	.081	.115	.157	.205	.259	.321	.389					
	C	950	750	630	530	465	415	365	330					
	D	.041	.064	.092	.125	.163	.207	.256	.310					
B-3-125-	U	1425	900	633	457	350	278	220	182					
	D	.051	.081	.115	.157	.205	.259	.321	.389					
	C	1425	1125	950	800	700	625	550	500					
	D	.041	.064	.092	.125	.163	.207	.256	.310					
B-2-150-	U	1365	880	610	445	340	266	220	182	150	128	110		
	D	.043	.067	.094	.131	.166	.216	.267	.324	.385	.440	.522		
	C	1365	1100	915	785	608	600	550	500	450	415	385		
	D	.034	.053	.077	.104	.137	.173	.214	.259	.308	.361	.418		
B-3-150-	U	2050	1320	917	672	512	400	330	273	225	192	164		
	D	.043	.067	.094	.131	.166	.216	.267	.324	.385	.440	.522		
	C	2050	1650	1375	1175	1025	900	825	750	675	625	575		
	D	.034	.053	.077	.104	.137	.173	.214	.259	.308	.361	.418		
B-3-175-	U	2800	1780	1230	915	700	544	440	364	308	262	228	175	133
	D	.038	.057	.082	.112	.147	.185	.229	.276	.330	.387	.450	.580	.737
	C	2800	2225	1860	1600	1400	1225	1100	1000	925	850	800	700	600
	D	.029	.046	.066	.090	.117	.148	.183	.221	.264	.308	.358	.468	.593
B-3-200-	U	3650	2340	1618	1200	912	723	580	482	400	346	293	225	178
	D	.032	.050	.072	.099	.128	.163	.201	.243	.289	.341	.397	.516	.651
	C	3650	2925	2425	2100	1825	1625	1450	1325	1200	1125	1025	900	800
	D	.026	.040	.057	.078	.102	.129	.160	.193	.230	.269	.314	.409	.518
B-3-225-	U	4650	2960	2065	1515	1150	912	740	608	516	438	379	288	228
	D	.027	.044	.064	.087	.113	.148	.177	.214	.255	.305	.349	.455	.574
	C	4650	3700	3100	2650	2300	2050	1850	1675	1550	1425	1325	1150	1025
	D	.023	.035	.051	.070	.091	.115	.142	.172	.204	.240	.279	.364	.460

The color area. To avoid excessive deflection, load-span combinations outside color area are not recommended.

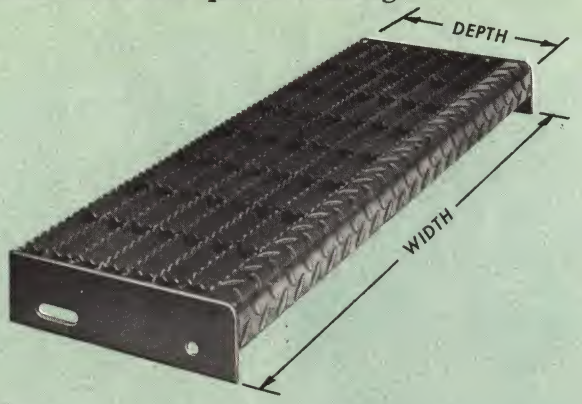
Fiber stress. Maximum allowable 16,000 lbs per sq inch.

Federal specification. Table is based on Federal Specification RR-G-661a

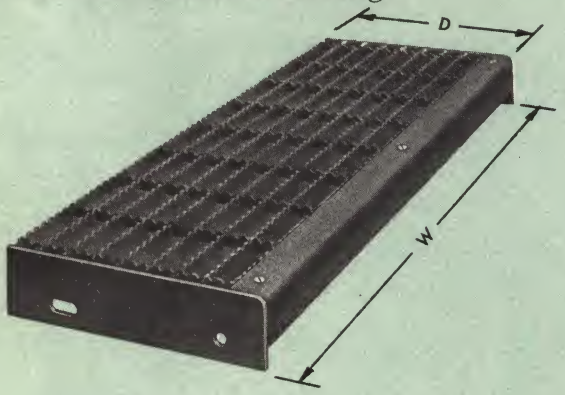
For prices and other information, write or phone your nearest Bufnel office. See back cover.

SMITHWAY STAIR TREADS

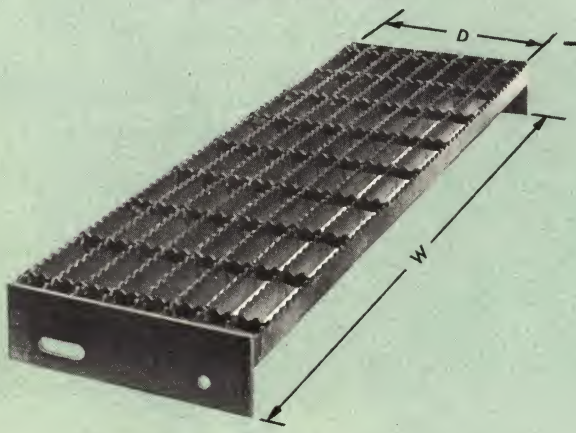
With checker plate nosing



With cast abrasive nosing



Without nosing



Width	To 3'0"	To 3'6"	To 4'0"	To 4'6"
Bearing Bar Size	1/8"x 1"	3/16"x 1"	1/8"x 1 1/4"	3/16"x 1 1/4"
Code Number	B-2-100- (S or P)	B-3-100- (S or P)	B-2-125- (S or P)	B-3-125- (S or P)

Maximum recommended tread widths for various size bearing bars
(Tread width is length of bearing bars plus thickness of the two carrier plates)

Type B grating is used in most stair treads. Therefore, the data on this page refer to Type B. When you want Type A or C, and specify a stair-tread depth from these tables, we will supply treads that measure within 1/4" of your depth specification.

For safety, we recommend the serrated-surface safety grating for stair treads. We can also furnish them with smooth-surface grating.

When required, other depths than standard (dimension D) can be furnished.

When other than standard carrier-plate dimension A is required (to accommodate holes in stair stringers) always specify the hole spacing desired.

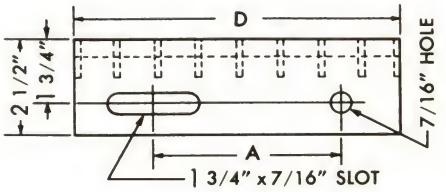
Standard tread depths | checker plate nosing, cast abrasive nosing

1/8" Bearing Bar		3/16" Bearing Bar	
Dimension D	Dimension A	Dimension D	Dimension A
7 1/4	3 1/4	7 5/8	3 5/8
8 3/8	4 3/8	8 13/16	4 13/16
9 1/2	5 1/2	10	5 15/16
10 5/8	6 5/8	11 3/16	7 1/16
11 3/4	7 3/4	12 3/8	8 3/16
12 7/8	8 7/8	12 9/16	9 3/8
14	10	14 3/4	10 9/16

All dimensions in inches

Standard tread depths — without nosing

1/8" Bearing Bar		3/16" Bearing Bar	
Dimension D	Dimension A	Dimension D	Dimension A
5 3/4	1 7/8	6 1/8	2 1/4
6 7/8	3	7 5/16	3 7/16
8	4 1/8	8 1/2	4 9/16
9 1/8	5 1/4	9 11/16	5 11/16
10 1/4	6 3/8	10 7/8	6 13/16
11 3/8	7 1/2	12 1/16	8
12 1/2	8 5/8	13 1/4	9 3/16



Carrier plate detail shows standard drilling

What to specify in your order

Code Number. The number that gives a full description of grating. (See page 4.)

Panels. Number of pieces and dimensions of each. (See page 5 for tables of panel widths. See also the sketch below.)

Finish. Galvanized, painted or unpainted. If paint, please state type of paint and number of coats. (Normally, grating gets one coat, either red primer or black.)

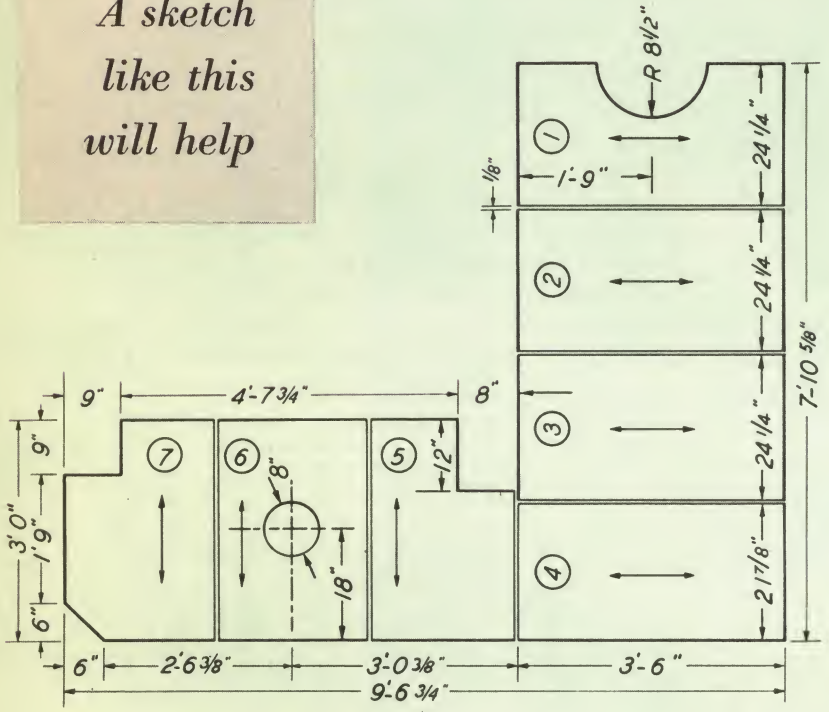
Banding. Are cutouts to be banded? Normally they are.

Stair treads. Code number of grating. Nosing. Width. Depth. Carrier plate hole spacing, standard or special. (See page 9.)

Shipping. Shipping date desired. Complete shipping instructions.

Send order to nearest Bufnel office (see back cover). Write or phone for additional information.

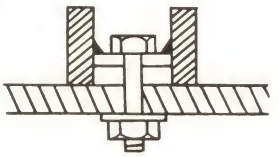
A sketch like this will help



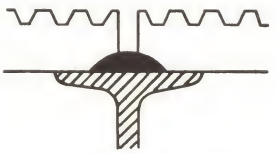
Two-headed arrows show direction of bearing bars. (They must run at right angles to supports – see page 5.)
Recommended spacing between panels, and clearance at ends of panels, is ⅛".
Numbers on panels will help installation.

We will hang a brass numbering tag on each panel, in accordance with your panel-numbers.
We give special attention to odd-shaped panels, and to accuracy of placement of cutouts.

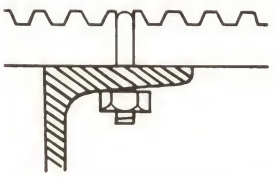
Suggestions for anchoring floors



Removable joint. Weld steel plate to bearing bars and bolt to supports.



Permanent joint. Weld bearing bars to support members.



Removable ¼" J-Bolt. Bolt fits into serrations on safety grating. With smooth-surface grating, cut notch to prevent bolt from projecting above surface of floor.

Bufnel

Engineering Counsel

Floor design. We are staffed to advise you on any phase of floor design – or to design for you. That service is yours at no cost.

Economic studies. The design of a large steel floor (1,000 sq ft, say) often poses important economic problems. Steel costs money. How much steel to use in the supporting structure? How much in the floor? Might a saving in support-steel bring the cost of a grating floor below that of a steel plate floor? We will be glad to assist you, at no cost, with such an economic-balance study.

Quantity discounts

We offer worthwhile quantity discounts. It may be helpful to remember that you can save money by consolidating your orders to avail yourself of those discounts.

One of our qualified representatives will be glad to call on you and explain our current prices and discounts. If you prefer, we will mail you that information.

Guarantee

Bufnel Company, Ltd., guarantees Smithway open steel floors to meet all conditions as specified in the Selection Chart and Table (pages 7 and 8). We stand back of our products and our recommendations.

Special Orders

When a job calls for a grating other than those specified in this booklet, Bufnel makes it to order. We make grating in aluminum alloy or special steels. We make grating for extra heavy loads.

The not-so-obvious jobs

...where Smithway gratings do a good job

Fire escape floors
Trench covers
Storm-drain openings
Concrete armoring
Industrial grilles
Truck cab and radiator protectors
Hand rails
Removable mats around heavy duty machine tools and equipment

Look at us through the eyes of our customers

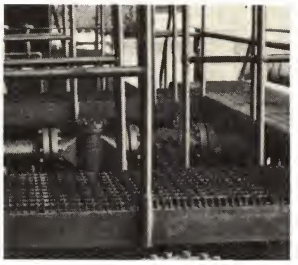
These are some of the Western Industrials who are buying Smithway floor gratings from Bufnel...

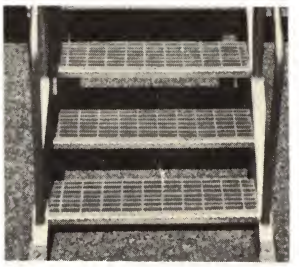
American Can Company
Austin Company
Bechtel Corporation
Crane Co.
Douglas Aircraft Company, Inc.
Fluor Corporation, Ltd.
General Pacific Co.
General Paint Company
General Petroleum Corp.
Ideco Division, Dresser Equipment Co.
Offco Construction Co.
Pacific Coast Borax Company
Pacific Telephone and Telegraph Company
Richfield Oil Corp.
Shell Chemical Corp.
Shell Oil Company
Standard Oil Company of California
Standard Steel Company
Van Camp Seafood Corporation
U. S. Air Force
U. S. Bureau of Reclamation
U. S. Corps of Engineers

Western grating stocks for Western customers

Bufnel stocks Smithway floor grating on the West Coast for immediate delivery in the Western States. When it comes to getting orders out when you want them, this is an outfit you can depend on.

Bufnel helps engineer a job...fabricates it to specification





Bufnel makes floors...and walkways...and stair treads

SERVING INDUSTRY IN THE WESTERN STATES

Bufnel

Bufnel Company, Ltd. Engineers and Steel Fabricators

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